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## Brain death symposium: Commentary 2

# Return to Elsinore

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## Author's abstract

*No discussion of when an individual is dead is meaningful in the absence of a definition of death. If human death is defined as the irreversible loss of the capacity for consciousness combined with the irreversible loss of the capacity to breathe spontaneously (and hence to maintain a spontaneous heart beat) the death of the brainstem will be seen to be the necessary and sufficient condition for the death of the individual. Such a definition of death is not something radically new. It is merely the reformulation – in the language of the neurophysiologist – of much older concepts such as 'the departure of the (conscious) soul from the body' and the 'loss of the breath of life'. All death – in this perspective – is, and always has been, brainstem death.*

*Circulatory arrest is by far the commonest cause of brainstem death, but brainstem death can also occur as a result of intracranial catastrophes. It is then usually the infratentorial repercussion of supratentorial events.*


'To be, or not to be, that is the question...'
*Hamlet, Prince of Denmark*
Act III, Scene 1

## 1. The background

Before addressing the issues raised in the report of the Danish Council of Ethics (DCE) it is worth placing this report in a fuller context. E Jørgensen, one of the leading Danish exponents of the concept of brain death, who will be known to British readers of the specialised literature on the subject (1–5), in a personal communication, writes as follows:

'Criteria of brain death have been disputed here for 20 years.... In 1987 a Parliamentary majority finally supported a Bill put forward by the Minister of Justice. A statute on brain death should have been passed early in 1988. However an unwise coupling of the proposed statute to the laws on transplantation gave rise to a most untidy debate on the economic aspects of introducing treatment by liver and heart transplantation in Denmark, forcing the Minister to postpone legislation.

**Key words**

Death; brain death; brainstem death.

'The Danish Council of Ethics has had no influence whatsoever on this course of events.... The council had not been invited to deal with the criteria of death but, in my opinion, threw itself into the discussion in order to manifest its existence. Its statement came out in December 1988 and expresses the opinion of a majority of the council, seemingly influenced by ultra-reactionary divines. The minority of the council in favour of the criteria of brain death included the chairman, who is a judge, and two doctors.

'The statement of the council has had no impact as regards the attitude of Parliament, nor changed public opinion. Several Gallup polls prior to, as well as after, the time when the statement came out have shown that a steadily increasing majority of Danes agree to the concept of brain death and are in favour of legislation.'

## 2. A bad formulation

Be all this as it may the issues raised in the council's report must be addressed on their merit. In doing so a neurologist can but record a profound weariness, permeated by intense feelings of *'déjà vu'* and *'déjà entendu'*. To read, in 1990, that the 'criterion of death should be the cessation of cardiac activity' is like suddenly perceiving a glimpse of light from some distant star, itself extinct for many a year. Today controversy in this general area centres on the wholly unacceptable proposition that the vegetative might be suitable subjects for organ donation (6–8) or on the status of anencephalics (9,10).

To claim that the 'criterion of death should be the cessation of cardiac activity' – without explaining that one's cardiac activity is not an end in itself but that its quintessential purpose is the maintenance of one's cerebral circulation – is a slipshod formulation, from which absurd conclusions can readily be drawn. Imagine patient A (on the verge of death from a progressive and intractable cardiac cause). In the ITU across the corridor, also imagine patient B (with irreversible destruction of the brainstem, secondary to a massive subarachnoid haemorrhage). Because artificial ventilation is still being maintained patient B still has a beating heart. A transplant surgeon removes A's grossly diseased heart (which he consigns to the local pathology museum) and replaces it with B's young and still vigorously beating heart. What is the

ontological status of the two individuals? If the criterion of one's death is the cessation of one's cardiac activity, then patient A (happily walking out of hospital a month after his operation) is *dead*, whereas patient B (the totality of whose mortal remains – except his heart – have been interred in the local graveyard) is very much *alive*.

The DCE would argue that an individual cannot be deemed dead while his or her heart is still beating. Such a stance is physiologically naive and fails to face up to real problems created by modern technology. These problems will not go away just because we refuse to face up to them. The DCE pronouncement that 'the criterion of death should be the cessation of cardiac activity' fails to grasp that it is an adequate blood flow of oxygenated blood to the 'brain as a whole' brain – not cardiac function *per se* – that is of relevance.

The heart may go on beating following decapitation and chronic experimental models of such preparations have been produced. Are such preparations alive or dead? The tissues may be alive but what gave the original animal any individuality is surely dead. The 'whole of the organism' may not be dead but the 'organism as a whole' – perceived as an independent biological unit – most assuredly is. The DCE report evades all reference to this issue.

What bearing therefore does persistent 'cardiac activity' have on the question of whether an individual is alive or dead? There are no unequivocal correlations, one way or the other. Mechanical devices will, by the end of the century, almost certainly replace the heart in a number of patients, who will be very much alive. In other cases such devices may only be pumping blood into tissues that are already dead.

Although quite literally heartless (his diseased heart having been removed and discarded) Barney Clark, the American dentist, remained very much alive for several weeks on a mechanical substitute. But the pump also worked relentlessly on while various organ systems sequentially failed to function. The pump was still working perfectly when everything else was deemed dead. At what point did this 'heartless' individual die?

## The real issues

But in a sense these are debating points, based on the DCE's inadequately thought out formulations. The real issues are cultural, and it is on this plane that the discussion should proceed.

The DCE report is, in my opinion, correct when it stresses that 'science...is not competent to take up the ethical aspects of death in all their religious, moral and in short human complexity'. Nearly 20 years ago it was stressed that answers were bound to vary when we asked the question 'what is it that is so essential to the nature of man that its loss is called death?'. This was because 'the question itself was essentially philosophical or moral, not medical or scientific' (11). I have myself argued (12) that technical data can never answer purely conceptual questions.

The DCE report argues that 'ethical considerations must be grounded in everyday experience'. No one could object to this requirement if it means that acceptable practice should be rooted in some kind of reality. Difficulties arise however when it is said that 'we must take as our guide, in establishing a concept of death, the everyday experience of death common to the individuals of a particular culture'. This is ambiguous because the experience is so variable. Which 'individuals' are being referred to? And is consensus possible in this sort of context?

Judaeo-Christian culture has for centuries held that the quintessence of death was the 'departure of the soul from the body' and the 'loss of the breath of life'. Would the DCE agree with this formulation? Or is this 'too cultural' for them, and would they prefer to ground their assessment of the prevailing culture in their seemingly erroneous perceptions of current public attitudes, in Denmark, to the question of brain death referred to above by Dr Jørgensen?

If the DCE accepts the broad framework of Judaeo-Christian culture should it not be prepared to translate such acceptance into terms more in keeping with our secular times? The 'departure of the soul from the body' would then become 'the irreversible loss of the capacity for consciousness' – the soul always having been thought of as a 'conscious' soul. And the 'loss of the breath of life' would become 'irreversible apnoea'.

If still with us the DCE would then have to confront the neurophysiological argument that these are functions of the upper and lower brainstem respectively, and that brainstem death very fully ensures the deepest requirements of the prevailing culture.

The DCE is right when it asserts that 'changing the criterion of death' would be 'an event of such significance that it should not be permitted without a major public debate on the ethical issues involved'. A well informed public is clearly essential when fundamental changes are proposed. The council is in error however (and in this it is still in abundant company) when it implies that the recognition of brain death is 'an event of such significance'. What is new is not a shift in the criterion of death, but the gradual realisation – as a result of experience in intensive care units (and of informed debate about it) – a) that *all death is, and always has been, brainstem death*, and b) that circulatory arrest (about which the DCE exhibits such concern) just happens to be the commonest way in which to bring such death about. [Circulatory arrest of shorter duration may have no neurological sequelae whatsoever. If of somewhat longer duration it may result in various degrees of cerebral damage sparing the brainstem, the cerebral hemispheres being more vulnerable to anoxia than the brainstem.]

While brainstem death is usually the intracranial repercussion of extracranial events (such as persistent circulatory arrest) it can of course also occur as a consequence of primary intracranial catastrophes.

Destruction of the brainstem as a result of such catastrophes may kill a person (ie render him or her 'irreversibly unconscious' and 'irreversibly apnoeic') just as efficiently as circulatory arrest. In other words, while there is only one kind of death (brainstem death) there may be several ways of dying (ie of bringing brainstem death about). Unawareness of these very simple and very basic propositions still seems to me to be at the root of much residual misunderstanding about brain death, including the views of the DCE.

## The soma and personal identity

The DCE seems, in a way, to sense all this. It states there is 'no doubt' that brain death 'means that the death process has begun and is irreversible'. It then goes on to ask 'when has the death process ended?' and answers 'with cessation of the heartbeat and of the circulation'.

This is an unsatisfactory answer for anyone familiar with the realities of brain death. It is moreover a dubious answer – ethically speaking – for it seeks refuge behind the public's current ignorance of certain basic facts.

Firstly, if the notion of a 'death process' is to have valid meaning (ie to be grounded in the real world) it should be something extending over hours or days, rather than over weeks or months. There is increasing evidence however that with the use of antidiuretic hormone (ADH) and other preparations the heart of the brain dead can be kept going for much longer than was originally thought (13). Are these artificially maintained preparations – with no human attributes other than form – live human beings? Even without such biochemical manipulations there are problems. With the artificial heart on the horizon it will soon no longer be possible to argue that brainstem death is death 'because of its hopeless cardiac prognosis'. The real philosophical issue will then have to be confronted, namely that brainstem death is death in its own right (death being defined as the 'irreversible loss of the capacity for consciousness combined with the irreversible loss of the capacity to breathe spontaneously and hence to maintain a spontaneous heartbeat').

Secondly there seems to me confusion in the DCE report as to where 'identity' resides. The report states that the 'identity of a person comprises the integrality of consciousness and body', and that 'identity relates no less to the body than to the mind'. If 'the body' is of equal relevance as the mind (in the determination of identity) is not the implication that all parts of the body should be documented as dead before death is ever diagnosed? Among the more obvious hallmarks of somatic identity would be the fingerprints and the blood group phenotype. Is the DCE really demanding decomposition sufficient to obliterate all traces of these hallmarks before it would be prepared to deem a body dead? After an appropriate delay circulatory arrest will certainly ensure somatic death but even here the facts are complex. After irreversible asystole various organs die at various stages, depending on their capacity to withstand total deprivation of their blood supply. The pupils will continue to constrict in response to pilocarpine drops for at least two hours, percussion myoidema* can be elicited three hours after irreversible asystole and viable skin grafts, bone grafts and arterial grafts can be harvested at 24 hrs, 48 hrs and 72 hrs respectively. It has been claimed that the hair and nails may go on growing for up to a week. When does the 'death process' end in *this* somatic perspective?

In conclusion it must be re-asserted that death of the brainstem provides a universally applicable – and philosophically acceptable (14) – standard of death. The most widely available means of ascertaining that such death has occurred is by documenting that cardiac and respiratory functions have ceased for an appropriate period of time. (In this respect the failure to detect breathing, combined with the failure to record a blood pressure, feel a pulse or hear a heart sound, are acceptable substitutes for testing the pupillary responses to light, for attempting to elicit corneal reflexes, or for irrigating the ears with ice cold water). But in comatose and apnoeic individuals in intensive care units the death of the brainstem can be ascertained by more direct means (15). Under these circumstances the time of death is when the doctor declares the patient dead. Is this so very different from what has always been the case? Even over the last 20 years there have been far more misdiagnoses of death based on cardiovascular criteria than there have been in relation to brain death. The record here is reassuring. Patients fulfilling clinical criteria of brainstem death (and in whom ventilation was continued) have all developed asystole. And none have ever regained consciousness before that.

Can we ask for more? I doubt it. Despite the misgivings of the Danish Council of Ethics I think we could today reassure Hamlet that – whatever his heart might be doing – by the time he could no longer think or breathe he would genuinely have reached the 'undiscover'd country from whose bourn no traveller returns'.

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* 'Myoidema': a mechanical contraction of muscle in response to percussion, the contraction not being associated with electrical concomitants.

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